

AMENDMENTS TO THE SPECIFICATION

Please replace the entirely redacted specification with the substitute specification, a clean copy of which follows beginning on a separate page:

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to article telescopic lifting and transport devices. More particularly, the invention concerns a dolly-like apparatus which is specially designed for use in telescopic lifting and transporting hot water heaters into attics.

2. Discussion of the Prior Art

Article telescopic lifting and transport devices such as two-wheeled transport dollies are well known in the art. However, such devices are not well suited for telescopic lifting and transporting articles such as hot water heaters into attics. In this regard, because of the weight of the hot water heaters and their location of installation, telescopic lifting of the hot water heaters for repair or replacement is often cumbersome, difficult, and unsafe. For example, both commercial and residential water heaters are heavy, difficult to grip and exhibit a tendency to fall on workman while lifting into attic. Therefore, as a general rule, moving and installation of such hot water heaters is a two-person or more operation so that the hot water heaters can be lifted and at the same time safely balanced. In the case of a hot water heater because of its weight and the location, it is often necessary to attach a pulley to cross rafters with a rope to pull or lower the hot water heater into place. This is inefficient, difficult and unsafe.

The thrust of the present invention is to overcome the prior art difficulties of handling hot water heaters by providing a specially designed, easy-to-use article telescopic transport dolly which can be used by one person to safely and easily lift and transport of such hot water heaters to attic location. The improved dolly includes strategically positioned, vertically adjustable telescopic lifting frame and a cooperating article stabilizing means which permits the hot water heaters to be lifted with minimum effort while they are being maintained in a stable orientation on the dolly. Both the telescopic lifting frame and the stabilizing means are adjustable so that upon moving the lifting plate of the apparatus into a downward operating position, the dolly can be used in a traditional manner such as a conventional two-wheeled dolly. When the telescopic lifting frame, the stabilizing means and the lifting plate are in their retracted position, the dolly assumes a low-profile configuration for easy storage and transport.

A number of lifting devices have been suggested in the past for limited lifting and transporting devices. One such device is disclosed in U.S. Pat. No. 5,358,217 issued to Dach. This patent describes a four-wheeled dolly for lifting lawn and garden tractors by which can be lifted by a hydraulic jack unit.

Another somewhat similar prior art lift and rotate device is disclosed U.S. Pat. No. 5,839,876 issued to McCarthy and Bacella. The McCarthy and Bacella device comprises a 4-wheeled dolly having a lift and rotate assembly.

Still another hand dolly for vertical lifting and transporting small loads is described in U.S. Pat. No. 5,114,118 issued to Schrader. This apparatus includes a 4-wheeled wheeled movable frame and a frame designed to lift and transport light loads.

There are no transporting and telescopic devices for lifting of hot water heaters from floor to attic. A lack of functionality of many of the prior art lifting and transport devices is that the devices tend to be of very

heavy construction which precludes the use as a limitation of the dollies uses. Another drawback of certain of the prior art telescopic devices is that they are bulky making them difficult to transport and store. Further, while the devices are usable for telescopic lifting or transporting devices, they do not combine the ability to lift hot water heaters into or out of attics for installing, removing and transporting.

SUMMARY OF THE INVENTION

It is an object of the present invention to provide an improved article telescopic transport dolly which is specially designed for telescopic lifting and transporting hot water heaters in and out of attics.

Another object of the invention is to provide an improved article transport truck of the aforementioned character, which includes uniquely positioned, adjustable telescopic lifting frame which can be used to engage and conveniently lift hot water heater with minimum effort and without damaging the fixture.

Another object of the invention is to provide an improved article transport truck of the character described in which the telescopic lifting frame and the lifting plate of the device can be adjusted relative to the dolly frame so that they can be conveniently moved from an fully telescopic position extending, operating configuration into a stowed position to enable the dolly to be conveniently stored and transported.

Another object of the invention is to provide an improved article transport truck as described in the preceding paragraph which includes novel braking system to preclude horizontal movements of the wheels during the lifting and installation operation.

Another object of the invention is to provide a telescopic frame to extend to attic for restrain ably engaging and stabilizing the hot water heater during telescopic lifting and transport.

Another object of the invention is to provide an improved article transport dolly which is lightweight, easy to use and is of a durable and rugged construction.

Another object of the invention is to provide an improved article transport dolly of the class described in the preceding paragraphs which is specially designed so that it can be conveniently stored and transported.

Another object of the invention is to provide an improved article transport dolly which is of simple construction, embodies a minimum number of moving parts and can be inexpensively manufactured and marketed.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other features of the invention will become more apparent from the following description in which reference is made to the aped drawings, wherein:

FIG. 1 is a perspective view of a first embodiment of the lift truck apparatus constructed in accordance with the teachings of the present invention.

FIG. 2 is a generally perspective view of the lift truck similar to FIG. 1 but showing the Retractable arms of the hand truck in an up-raised position and the braking system engaged.

FIG. 3 is a cross-sectional view of the lift truck illustrated in Fig. 1.

Fig. 4. is a side elevation view as shown in FIG. 1.

FIG 5. is a back plan view of the lift truck illustrating the retractable legs in their stowed position illustrated in FIG. 1.

FIG 6 is a back view of the lifting apparatus illustrated in FIG 1.

FIG 7. is a cross-sectional view partially in section of the lifting apparatus illustrated in FIG. 1.

FIG 8. is a perspective view of a second embodiment of a lifting apparatus constructed in accordance with the teachings of the present invention.

FIG. 9 is a cross-sectional view of the lifting apparatus illustrated in FIG. 8.

FIG 10. is a cross-sectional view of the lifting apparatus illustrated in FIG. 8.

FIG 11. is a side view of the lifting apparatus illustrated in FIG. 8.

FIG 12. is a back view of the lifting apparatus illustrated in FIG 8 with vertical lifting point attachments.

FIG 13 is a front view of the lifting apparatus illustrated in FIG 8.

FIG 14 is cross-sectional view of the lifting apparatus illustrated in FIG 8.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The preferred embodiment, lifting apparatus generally identified by reference numerals 21 and 23, will now be described with reference to FIGS. 1 through 14. FIGS. 1 through 7 illustrate a first embodiment 21. FIGS. 8 through 14 illustrate a second embodiment 23. First embodiment 21 and second embodiment 23 arrange the same basic components in alternative manners, as will hereinafter be further described.

Referring to FIGS. 1 through 14, lifting apparatus 21 and 23 both include a movable frame 11 that comprises of two wheels 18, a braking system 15, and extending stabilizing legs 32. Movable frame 11 extended stabilizing legs 32 attached to plate for support of legs which is attached to frame 11 which have lever form locking mechanisms 33, which are supported by rotatably mounted wheels 36. Wheels 36 and 18 facilitate movement of movable frame 11 throughout a working area. Two L Brackets 12 vertically mounted on side supports 14 from movable frame 11. Cross members 10 are secured to side supports 14 mounted on moveable frame 11. Two vertically mounted handles 38 on back of cross members 10, supported from movable frame 11. Two flat steel supports 44 for horizontally mounted axel 20 for support of wheels 18. A substantially vertically mounted support bracket 22 for stabilizing brake axel 17. Three evenly spaced small pieces of C Channel 15 and 16 attached on braking axel 17 by applying pressure to brake foot pedal 16 the other two pieces of c channel mounted above wheels 18 press against wheels and braking arm 51 locks over axel for support of wheels 20 with the guidance of vertically mounted guides for braking arm 47 with tension provided by springs 40 lock wheels 18 resulting in immobilizing the lifting and telescopic dolly. C channel for lower frame 11 has multiple holes 42 in top of left and right c channels when matched with holes in extended telescopic frame 7 by cranking hand crank 52 which is connected by cable 49 through pulley 50 to lower portion of telescopic frame 7 and insertion of safety locking pins 13 allows for locking telescopic frame 7 into desired height. Support wheels mounted in top of C Channel 11 and lower portion of c channel of telescopic frame 7 provides support and stability for telescopic frame when extended. Telescopic frame 7 is horizontally supported by cross members 9. Two L Brackets 8 vertically mounted on side supports telescopic frame 7 for upper support of Lift plate 31. Support for Lift plate 31 is provided by 3 sets of wheels 29 on each side on back of lift. Outer set of wheels 29a secures lift plate 31 to lower L bracket 12 which in turn secures it to lower frame 11. Middle set of wheels 29b supports the weight of lift plate 31 and load 41 on top edge of c channels 11 and 7. Inner set of wheels 29c support for lift plate 31 to L bracket 8 on telescopic frame 7. Lift plate 31 is elevated by Hand crank 1 which is attached to cable 27 which is attached to upper portion of Lift plate 31. Lift plate supports hot water heaters 41 which are secured to lift 31 by support straps 39. Hand crank 1 is fastened to support platform 2 which is attached to neck support 3 which is connected to horizontal support 6. C Channel for support arms 4 is attached to horizontal support 6 which is top support for C channels 7. Retractable support arms 5 are attached to c channel support 4 supporting lifting and telescoping dolly in extended position. Retractable support arms when extended are placed of rafters in attic to stabilize lifting and

~~telescopic dolly. After installation of hot water heater 41 lift is lowered to bottom dolly by reverse cranking of hand crank 1. Handle 38 is mounted on lever for retraction of arms 37 which is connected to retractable support arms 5 by cables 46 through a series of pulleys 25 which tension applied by springs 40 which are attached to retractable support arms 5 and c channel for support 4.~~

Please replace the specification with the following substitute specification:

LIFTING AND TELESCOPING DOLLY

FIELD OF THE INVENTION

[0001] The present invention relates to the field of devices used for transporting objects, more specifically to the field of hand-operated, wheeled devices. Such devices are commonly referred to as hand trucks, carts, or dollies.

SUMMARY OF THE INVENTION

[0002] No state-of-the-art dolly offers all the features of the the present invention. The present invention features a support member that makes it possible to hoist an object at various angles other than vertical, thus enabling the hoisting of an object into an attic having a pull-down staircase. The present invention enables one-person operation. It also provides an integral top support member that attaches to a fixed part of the attic construction, such as a rafter or beam.

[0003] The present invention provides a dolly the height of which can be telescoped from approximately that of dollies commonly used for moving furniture, household goods, appliances, and commercial stock to a height sufficient for hoisting objects from a floor or ground surface into an attic.

[0004] The present invention provides a dolly with a foldable support member that permits hoisting of objects at angles inclined from the vertical.

[0005] The present invention provides a telescoping dolly that incorporates a means of attaching the topmost section of the dolly to a structural member near an attic access in order to safely stabilize the dolly during the operation of hoisting an object from a floor or ground surface into an attic.

[0006] The present invention provides a dolly that enables an operator, acting alone, to safely hoist an object into an attic, remove the object from the dolly, and place the object on the attic floor.

[0007] The present invention provides a dolly with a lockable, collapsable support member that permits hoisting of objects at angles inclined from the vertical.

[0008] The present invention provides a dolly with a braking system.

[0009] The present invention provides a dolly that collapses into a compact profile that can be conveniently transported and stored.

[0010] The present invention provides a dolly of simple and lightweight, yet durable, construction that can be inexpensively manufactured.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] Fig. 1 is a front isometric drawing of the dolly of the present invention loaded with a phantom load.

[0012] Fig. 2 is a rear isometric drawing of the dolly of the present invention loaded with a phantom load.

[0013] Fig. 3 is a rear orthogonal drawing of the dolly of the present invention with the rear support member folded inward and flat against the rear face of the main member, and the phantom load resting on the base member that is flat on the floor or ground surface.

[0014] Fig. 4 is a front orthogonal drawing of the dolly of the present invention with the rear support member folded inward and flat against the rear face of the main member, and the phantom load resting on the base member that is flat on the floor or ground surface.

[00015] Fig. 5 is a front isometric drawing of the dolly of the present invention telescoped to full extension and loaded with a phantom load hoisted to its maximum height.

[00016] Fig. 6 is a rear isometric drawing of the dolly of the present invention telescoped to full extension and loaded with a phantom load hoisted to its maximum height.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[00017] Fig. 1 illustrates a preferred embodiment of the lifting and telescoping dolly 100 of the present invention, the function of which is to transport and hoist a load 200 resting on base member 31 and held to the front face of main member 12 with releasable strap 39. Dolly 100 is moveable via an axle assembly and wheels 18 attached near the bottom edge of main member 12. When necessary, rolling transport of dolly 100 is checked by operator-activation of braking system 15 that with a commonly understood lever-actuated system of cables applies a compressive force to some area of axle and wheel assembly 18.

[00018] Support member 32 is pinned or otherwise attached to pivot brackets 45 attached to main member 12. One end of each of the two telescoping support struts 34 is pinned, hinged, or otherwise rotatably attached to support member 32, and the other ends of support struts 34 are slidably attached to main member 12 so that support member 32 may be positioned at various angles with respect to main member 12, and locked in position with locking devices 33 such as pins, locknuts, or over-center clamps that when engaged maintain support member 32 in a position fixed relative to main member 12. Two support axle and wheel assemblies 36, located at the bottom edge of support member 32, in conjunction with axle and wheel assembly 18, facilitate rolling transport of dolly 100.

[00019] Two handles 38, attached to the rear face of main member 12, provide means for an operator to grasp and maneuver dolly 100 during transport. Handles 38 also

provide support when support member 32 is folded parallel to main member 12 and dolly 100 is lowered and positioned such that it is essentially parallel to the floor or ground surface.

[00020] Figs. 1 and 6 show that the illustrated embodiment includes a receiver tube 41 near the top edge of main member 12. Each end of receiver tube 41 receives a support arm 5 capable of sliding from a position recessed inside receiver tube 41 to a position substantially exposed but still engaged with receiver tube 41.

[00021] Fig. 2 shows winches 1 and 2, and their respective cranks 10 and 20. Winch 2, attached slightly below the top edge of main member 12, is turned by an operator with crank 20. Turning of winch 2 causes cable 21 (see Figs. 1 and 3), attached to the drum of winch 2 and led through a system of commonly understood pulleys and guides to the bottom of secondary member 7, to slide secondary member 7 (see Figs. 1 and 4) inside main member 12. Secondary member 7 is a rigid tubular frame, the long sides of which are captured by but can slide, and, assisted by wheels or bearings, roll, in the long sides of main member 12, constructed of C-section beams.

[00022] An operator can load an object 200 onto base member 31, secure it to dolly 100 with adjustable attachment strap 39, and transport dolly 100 and its load to a position near an attic access. The operator can rotate support member 32 away from its transport and storage position that is substantially adjacent and parallel to main member 12. Such rotation extends foldable support struts 34, and the operator can engage locking devices 33 so as to orient main member 12 in a substantially A-frame configuration. The operator can activate and lock brake system 15 that forces brake pads against the dolly wheels and prevents further rolling transport of dolly 100.

[00023] With winch 2, an operator can extend secondary member 7 from main member 12 until the bottom edge of secondary member 7 is close to the top edge of main member 12. Pins (not shown) can be inserted into holes 44 on both long sides of main member 12 and through mating holes (not shown) on the long sides of secondary member 7 to prevent secondary member 7 from further movement with respect to main member 12 until the pins are removed.

[00024] Fig. 3 shows winches 1 and 2 and their respective cables 27 and 21. Wheels 11 and wheels 10 (see Fig. 4) are attached to secondary member 7 and engage the insides of the C-section beams that make up the long sides of main member 12, thus facilitating telescoping of secondary member 7 with respect to main member 12.

[00025] Fig. 4 shows one set of wheels 10 that, along with the set of wheels 11 (see Fig. 3), facilitates the telescoping movement of secondary member 7 within main member 12. Fig. 4 also shows a system of cables and pulleys 25 that controls the position of support arms 5 in receiver tube 41 (see Figs. 1 and 2) as discussed below.

[00026] Fig. 5 shows dolly 100 in its fully extended configuration with locking devices 33 locked to prevent collapsing of support members 34, and brake system 15 activated to prevent rotation of axle assembly and wheels 18. From Fig. 5 it can be seen that dolly 100 could be positioned in its extended configuration at various angles with reference to the floor or ground surface, depending on the position of support member 32. Because of its angled configuration, dolly 100 is capable of providing access to an attic equipped with a pull-down staircase if the bottom section of the staircase remains folded.

[00027] Fig. 6 shows dolly 100 in its fully extended configuration. While the operator extends secondary member 7 from main member 12, support arms 5 are recessed into receiver tube 41. When secondary member 7 enters an attic access, the operator toggles lever 42 that causes cable and pulley system 25 to release a detent (not shown) in receiver tube 41. Release of the detent permits springs 26 to urge support arms 5 outward from their positions recessed into receiver tube 41. In their extended positions, support arms 5, which in an alternative embodiment may be shaped like hooks, span two adjacent attic rafters and provide support for the top of extended dolly 100.

[00028] With support arms 5 resting on attic rafters, locking devices 33 locked, and brake system 15 activated, dolly 100 is stable and secure. Then the operator may access the attic, and, with winch 1 and cable 27, hoist base member 31 and load 200 upward from the floor along the extended combination main and secondary members 12 and 7 until it is in position to be unloaded onto the attic floor.

[00029] After the load is removed from dolly 100, the operator, while still in the attic, may use winch 1 to lower base member 31 from the attic to the floor or ground surface. Then the operator may leave the attic, and, from the floor or ground surface, toggle lever 42 so that cable and pulley system 25 operates to retract support arms 5 into receiver tube 41, thereby disconnecting the top of dolly 100 from the attic rafters upon which it had been supported during the hoisting operation.

[00030] The operator may then use winch 2 to lower secondary member 7 from its extended position in the attic to its non-extended position telescoped into main member 12. Locking devices 33 may be released, support members 34 collapsed, and support member 32 rotated into its storage position substantially adjacent and parallel to main member 12. Brake system 15 may be released, and dolly 100 moved to a storage location.

[00031] It will be apparent to those with ordinary skill in the relevant art having the benefit of this disclosure that the present invention provides an apparatus for moving objects and hoisting objects from a floor or surface into an attic above the floor or surface. It is understood that the forms of the invention shown and described in the detailed description and the drawings are to be taken merely as presently preferred examples and that the invention is limited only by the language of the claims. While the present invention has been described in terms of one preferred embodiment and a few variations thereof, it will be apparent to those skilled in the art that form and detail modifications may be made to those embodiments without departing from the spirit or scope of the invention.